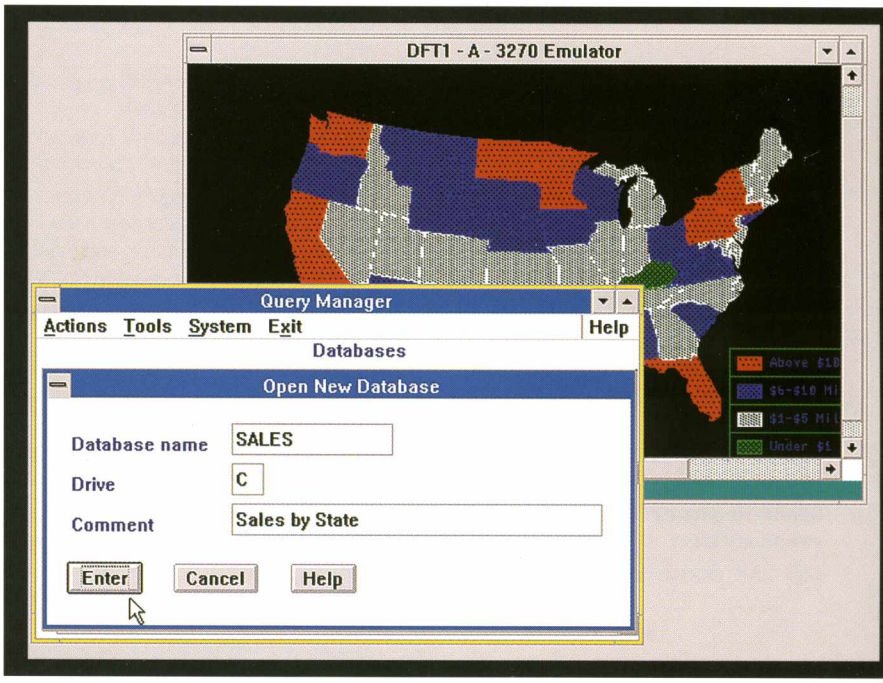
IBM

Extended Services

Breaking through

Above and beyond OS/2

With IBM Operating System/2® 2.0 as a base, you're ready to rise above the limits. And there's no better way to move up than with IBM Extended Services, which offers a choice of two configurations—Extended Services for OS/2 (without database server) or Extended Services with Database Server for OS/2.



Add Extended Services to OS/2® 2.0, and you'll get fast and flexible communications, versatile connections and sophisticated database capabilities. That's because Extended Services contains a comprehensive Database Manager that helps you manage information, a Communications Manager that lets you move it with ease. Using the Database Server configuration, everything from data to applications to processing tasks can be distributed among workstations, departmental systems and hosts.

Extended Services taps the power and realizes the promise of OS/2 2.0 in a multitude of ways for businesses of any size. It supports DOS, DOS Windows™ and OS/2 applications. It turns OS/2's multitasking capability into concurrent workstation-to-host sessions ... efficient LAN communications ... simultaneous database client/server interactions (Database Server required) ... and more.

Like OS/2, Extended Services enhances data reliability and system availability for your business applications. And you can count on the IBM database management and communications strategies implemented in Extended Services to carry you forward–they've been proven industry-wide. At the same time, you can be sure these strategies are flexible and geared to the future. So when you build your business with Extended Services, there's almost no limit to how high or how far you can go.

IBM Extended Services at work

Here are some of the ways you can put Extended Services to work for you:

- Access files, communicate with outside information services, and record transactions all at the same time
- Support peer-to-peer operations and distributed processing
- Speed development of applications that depend on quick access to departmental and/or central databases
- Make plant product-status information and parts inventories immediately available to front office management, sales personnel and order-entry staff
- Port applications across environments that vary in terms of connectivity, communications protocols, operating systems and hardware

Feature	Benefit
Communications Manager	
Integrated terminal emulation capabilities	• Give you flexibility to support a variety of IBM and non-IBM host-connected applications on a single workstation by emulating ASCII, IBM 3270 and IBM 5250 terminals • Combined with OS/2 2.0 concurrent multitasking capabilities, let you simultaneously transfer files to/from several different hosts
Network Device Interface Specification (NDIS) support	• Means you can pick and choose among communications adapters from a wide variety of vendors • Opens the door to new LAN protocols and to high-performance Token-Ring and Ethernet busmaster communications adapters conforming to the NDIS industry standard
Advanced Program-to-Program Communications (APPC)	• Delivers strategic distributed processing capabilities by enabling different network nodes to share resources and tasks • Provides for peer-to-peer interaction and communications among a variety of IBM systems • Serves as an interface for basic and mapped conversations • Supports multiple logical units and multiple concurrent links • Includes "persistent verification" to improve security
3174 Peer Communications support	• Lets workstations use APPC to interact with host systems or other workstations over coaxial cable • Introduces LAN capabilities into the coaxial-wired environment – without requiring installation of LAN cabling
Common Programming Interface for Communications (CPI/C)	• Offers the functions of APPC in a consistent form across the entire IBM Systems Application Architecture™ (SAA™) family • Permits smooth migration of applications from one SAA family member to another – from an OS/2 platform to an OS/400® platform, for example
Advanced Peer-to-Peer Network (APPN) support	• Offers a way for existing APPC applications to take advantage of peer networks • Brings you the benefits of peer networking – including simplified configuration, better availability, dynamic routing and easier maintenance • Promotes speedier processing of APPC applications across a LAN
5250 Workstation Feature (5250 WSF)	• When doing 5250 emulation, permits you to run as many as five AS/400® or System/36 terminal or printer sessions at once
Emulator High Level Language Application Programming Interface (EHLLAPI)	• Supports workstation-to-host communications in both 3270 and 5250 environments • Simplifies host interactions for users by allowing complex functions to be manipulated under program control • Facilitates file transfer, thanks to new support for structured fields • Can now support multiple applications at once
Server-Requester Programming Interface (SRPI)	• Functions as the programming interface for 3270 Enhanced Connectivity Facilities • Supports communications-independent requester program calls to a server program
SNA LAN gateway support	• Permits a workstation to function as a gateway providing host access for up to 254 other workstations on an IBM Token-Ring, PC Network, ETHERAND LAN, SDLC switched link, or X.25 network • Allows up to 127 sessions or clients to use the gateway concurrently • Makes it possible to bring host resources to many users while keeping modem and line costs down
X.25 protocols	• Permit connection to packet switched data networks worldwide • Provide for inexpensive long-distance data transmission • Enable both SNA and non-SNA communications to be sent over the same physical link
Asynchronous Communications Device Interface (ACDI)	• Lets asynchronous emulators and file-transfer programs exchange data over asynchronous links • Provides a high degree of independence from the adapter hardware used • Allows you to manipulate modem command strings and automate dialing procedures • Enables call redirection across a LAN to an asynchronous gateway
LAN programming interfaces	• Include both IEEE 802.2 and IBM NETBIOS for program-to-program communications • Support Token-Ring Networks, DIX V2.0 and IEEE 802.3 Ethernet networks, and PC Networks
Logical Unit Application (LUA) interfaces	• Provide base communications and file transfers for LU0, 1, 2 and 3 sessions • Facilitate migration of LU0 applications to the OS/2 environment
Common Services Interface	• Offers quick access to Communications Manager's integrated problem-determination functions • Allows many problem-determination functions to be performed under program control
Subsystem Management Interface	• Makes it easy for system administrators to control and obtain status information on the SNA communications resources being maintained by Communications Manager
System/370™ NetView® support	• Includes an S/370 NetView Remote Operations Facility and Router • Means administrators can use NetView and issue OS/2 commands to remote servers, gateways and workstations • Facilitates management of databases and servers that are located far from the central host site – a local operator need not be present

Communications Manager configuration and installation options	•Offer a choice of ways to tailor Communications Manager for your environment and begin using it without delay: –Custom Install allows system administrators to simplify end-user installation by creating diskettes containing the configuration file and specific Communications Manager components required at each workstation –Basic Configuration Services help users set up for 3270, 5250 and ASCII emulations by themselves –Advanced Configuration Services permit selective installation, addition, removal and reinstallation of any and all CM components at any time –Programmatic Configuration support permits configuration files for large numbers of workstations to be created and manipulated under program control

Database Manager

Relational Database SAA Structured Query Language (SQL) support	•Assures SAA SQL compatability with the high-level data definition and data manipulation language of IBM host database management systems, such as Structured Query Language/Data System (SQL/DS™) and DATABASE 2™ (DB2™) •For the first time, includes SQL date, time, time-stamp, arithmetic and scalar support •Offers compatibility with DB2 date/time data types
SQL Command Interface	•Allows users to issue SQL statements, database environmental commands and utilities directly from the OS/2 command line •Supports DDL/DML/DCL and union/intersect/difference functions •Provides built-in support for REORGCHK utility •Allows users to issue SQL statements to a database server on a LAN or host databases via IBM SAA Distributed Database Connection Services/2
Query Manager	•Lets users access, update and administer data–with no need to learn SQL syntax •Provides a user-friendly Presentation Manager™ interface for query, report, data entry/edit, and table creation
SQL Query Management Facility (SQLQMF)	•Downloads, imports and converts data from DB2 and SQL/DS host databases for use in Database Manager tables
Database Services	•Includes SQL-based utilities and functions for data access, management, integrity and protection •Also supports concurrency control, data import/export, referential integrity and grant/revoke privileges
Distributed Feature (Database Server configuration)	•Enables OS/2, DOS–and now, DOS Windows 3.0–client workstations to interact with OS/2 database servers •Reduces client workstation software requirements–besides the base operating system, only the database requester and LAN-transport code are needed
Remote Data Services (Database Server configuration)	•Give OS/2, DOS and DOS Windows client applications access to remote OS/2 database servers attached to a LAN •Make it seem to the user as if the database were local •Support remote client/server interactions in a variety of environments via NETBIOS, APPC or the SQL LAN-only option
Database Application Remote Interface	•Optimizes application performance in the remote client/server environment through a stored procedure supporting static and dynamic SQL •Includes implicit row/level lock, explicit table level, deadlock detection and data isolation functions
DOS Database Requester	•Lets DOS and DOS Windows applications access OS/2 Database Manager databases
Database administration tools	•Offer graphical interfaces for managing databases and directories •Include tools for: –Configuring Database Manager and a database –Configuring remote client/server and gateway connections (Database Server required) –Backing up and restoring a database •Now supply "industrial-strength" data protection and integrity solutions, including: –Forward recovery that permits speedy restoration of all changes made in a database since the last backup was performed –First Failure Support Technology/2 (FFST/2) that provides automatic, timely logging of database errors and error-related information

IBM SAA Distributed Database Connection Services/2 Version 1.0

Created to complement Extended Services, IBM SAA Distributed Database Connection Services/2 (DDCS/2) provides software connections for Database Manager clients and servers to databases on remote host systems. It gets workstation applications and host databases talking directly–but keeps the host's side of the conversation transparent. So users can access and update host database information just as if it were stored locally.

That's the case whether the client workstation application is running under OS/2, DOS or DOS Windows–and whether the host is holding a DB2, SQL/DS or OS/400 database. And it doesn't matter if the client's LAN connection is supported by NETBIOS, APPC, APPN or the LAN-only option of APPC. Altogether, with DDCS/2, you have lots of ways to achieve cross-platform interoperability.

DRDA: sending requests where they need to go...

The backbone of DDCS/2 is Distributed Relational Database Architecture (DRDA). Combining various IBM architectural building blocks, DRDA creates a datastream protocol that enables workstations to offload database tasks from hosts. Using SQL as a standard API, it locates requested data and establishes logical connections between workstation applications and host database management systems. And, if those applications utilize SAA SQL, there's no need for modification at the host.

DDCS/2: working for one and all

DDCS/2 is available in both single-user and multiuser configurations:

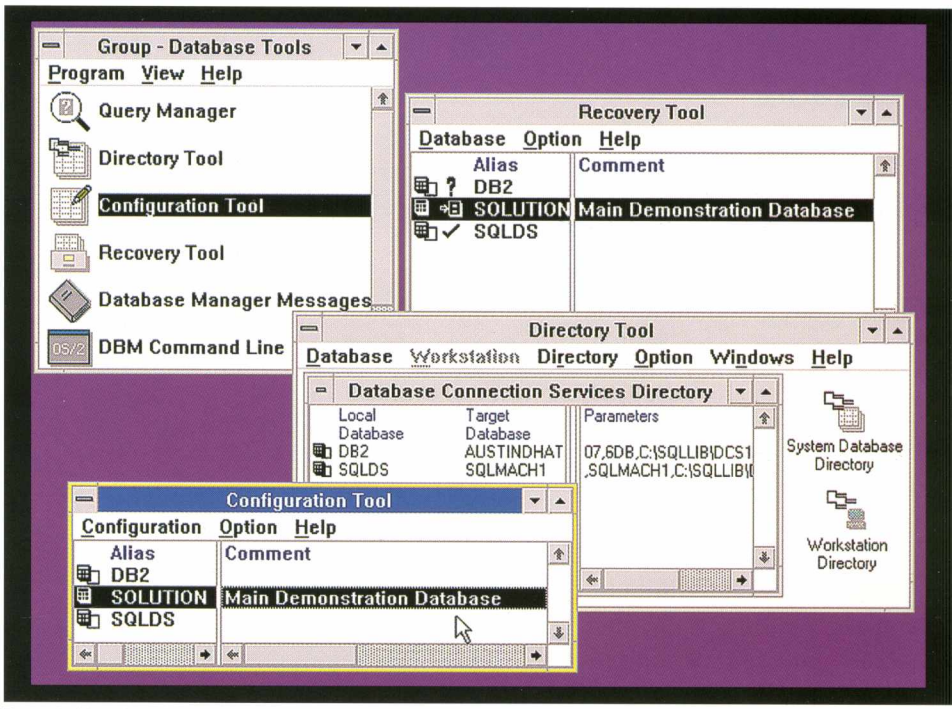
- With the single-user version, one workstation can issue its own local requests to a host database
- With the multiuser version, one workstation can function as a server gateway providing access to data in a host database for multiple clients on a LAN

Supplementary offerings

To help you exploit the power of Extended Services, IBM offers the following:

- OS/2 Version 2.0 serves as the workstation base operating system, provides true multitasking, and combines DOS, Windows and 16- and 32-bit OS/2 application support
- IBM SAA Distributed Database Connection Services/2 Version 1.0 equips an OS/2 workstation to act as a database gateway to a host (featured this page)
- OS/2 LAN Server Version 2.0 provides smooth resource-sharing around your LAN

Further, IBM will offer Extended Services Database Manager "front ends" to selected application developers. The purpose: to provide a head start for development of query and report-writing programs–as well as industry-specific database applications–that use Extended Services Database Manager.



Extended Services' Database Manager offers a comprehensive set of tools that simplify database configuration, administration and recovery.

IBM Extended Services connectivity summary

Supported system	Interface or emulation	Protocol	File transfer	Link[1]
IBM System/370 architecture (including 9370 Integrated Controller)	APPC	LU6.2		SDLC (3270, 3725, 3705, 3726, 3745 and 9370 Integrated Controller)
				Token-Ring (3720, 3725, 3726, 3745 and 9370 Integrated Controller[2]
				Token-Ring using 3174's 3270 Gateway Feature (#3025) for PU2.0[2]
				Token-Ring, PC Network or ETHERAND LAN using OS/2 SNA LAN Gateway
				X.25
	LUA	LU0,1,2,3		All above links
	3270 (including EHLLAPI)	LU2	3270-PC File Transfer Program	DFT via 3174/3274 (to SDLC, BSC or channel) and 9370 Workstation Program Controller
	3270 Print	LU1,3		SDLC (3720, 3725, 3705, 3726, 3745 and 9370 Integrated Controller)
	SRPI	LU2		Token-Ring (3720, 3725, 3726, 3745 and 9370 Integrated Controller)[2]
				Token-Ring using 3174's 3270 Gateway Feature (#3025) for PU2.0[2]
				Token-Ring, PC Network or ETHERAND LAN using OS/2 SNA LAN Gateway
				X.25
	3101, VT100	Async	3270-PC File Transfer Program	Async[3]
IBM Personal System/2® and IBM PC	APPC	LU6.2		SDLC, Token-Ring,[2] PC Network, ETHERAND LAN
				X.25
	ACDI	Async	XMODEM, ASCII[4]	Async
	NETBIOS IEEE 802.2	NETBIOS IEEE 802.2		Token-Ring, PC Network or ETHERAND LAN
IBM AS/400 and IBM System/36	APPC 5250 WSF (including EHLLAPI)	LU6.2 LU6.2	AS/400 PC Support	SDLC, Token-Ring, Twinaxial (AS/400 only, including 5394 Remote Control Unit), Ethernet (AS/400 only), 3174 Peer Communications
				X.25
IBM System/38 and IBM System/88™	APPC	LU6.2	Async (System/88 only)	SDLC, X.25 (System/38 only)
IBM Series/1™	APPC	LU6.2		SDLC
	3101	Async		Async
IBM RT®	APPC	LU6.2		SDLC, X.25
	VT100	Async	XMODEM	Async
Other hosts[5] or workstations[5]	3101,[6] VT100		XMODEM, ASCII[4]	Async
	X.25 API	X.25 (non-SNA)		X.25
	IEEE 802.2	IEEE 802.2		ETHERAND LAN

[1] The Extended Services Communications Manager supports combinations of these links subject to the limitations imposed by installed adapters, memory size and processor capacity. All supported SNA links are sharable by applications which may use up to ten 3270 display sessions (via SDLC or Token-Ring link with up to five, and DFT link with up to five) per workstation. Multiple concurrent SNA LU6.2 sessions per logical unit are supported over remote SDLC or local Token-Ring LAN links. Asynchronous links are serially usable.

[2] Both 4Mbit-per-second and 16Mbit-per-second IBM Token-Ring Networks are supported.

[3] Asynchronous users requiring SNA support must use a protocol converter on the link.

[4] Sending an ASCII text file to another system.

[5] Appropriately programmed.

[6] Character mode.

Why OS/2?

Here are some of the reasons why IBM Operating System/2 2.0 stands out as the best solution for your business needs.

Ease of use through graphical installation, object-oriented iconic "drag and drop" interface, and online contextual Help.

Support of DOS, Windows and OS/2 applications within a single environment.

Compatibility with the broadest range of applications, giving you the most flexible choice of programs plus the widest networking platform available.

Performance that's predictable and consistent when you're running multiple DOS, Windows and OS/2 applications.

True multitasking that enables you to access, utilize and manage information using multiple programs simultaneously.

32-bit addressability that means you can tap the potential of today's advanced microprocessing technology.

Enterprise-wide open system strategy that extends to every desktop and beyond–to different types of networks, databases and distributed processing environments.

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